New Thermobaric Materials and Weapon Concepts

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Small Business Information
GENERAL SCIENCES, INCORPORATED
205 Schoolhouse Road, Souderton, PA, 18964
Hubzone Owned:
N

Socially and Economically Disadvantaged:
N
Woman Owned:
N

Duns:
122998925

Principal Investigator:
Anthony Rozanski
Principal Investigator
(215) 723-8588
genscience@aol.com

Business Contact:
Peter Zavitsanos
President
(215) 723-8588
genscience@aol.com

Research Institution:

n/a

Abstract

Improvements in configuration of potential thermobaric warheads are presented. Such improvements in configuration will allow faster mixing rates, resulting in a reduction in total reaction time. Higher reaction rates, and lower reaction times lead to more complete reaction of thermobaric fuels, which will cause thermobaric weapons to better engage enclosed targets and cause more extensive damage than current configurations. Early work by these investigators suggests that a fraction of highly energetic thermobaric fuel can be ignited by an explosive shock and release its energy in a time period consistent with conditions required for increased peak pressure and impulse. The exploitation of this finding in terms of enhancing the reaction rates (both intrinsic and air combustion) through improved mixing techniques is the main objective of this program. Two approaches will be examined. The first approach will consist of a star shaped explosive core which will produce explosive jets, to enhance the mixing effect. The second approach will utilize alternating sections of reactive materials, one of lower density and one of higher density. The density mismatch will set up velocity gradients, resulting in a turbulent mixing of both reactive material components, as well as trapping the available air within the reaction zone.

* information listed above is at the time of submission.